FACTSHEET
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Alternative bunch rot control - Experimental trial

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Introduction

Botrytis and non-botrytis bunch rots are weather-driven diseases known to cause significant loss of grape yield and wine quality. Temperature and the duration of surface wetness are key environmental factors that promote bunch rot development.

The factsheet "Botrytis Management" provides more information on integrated measures for control of botrytis bunch rot .

The factsheet "Non-Botrytis bunch rots: Questions and Answers" provides more information on integrated measures for control of non-botrytis bunch rot.

In the Hunter Valley, weather-driven disease events are common across vintages. Anecdotal reports indicate naturally isolated *Trichoderma* species used on Chardonnay grapes in the Hunter Valley have been effective in the control of botrytis. However, statistically analysed trials on the efficacy of *Trichoderma* products in the Hunter Valley have been hampered in the past by dry seasonal conditions. Therefore, evidence to support the use of bio-fungicides to manage botrytis and non-botrytis in warm humid regions is required.

Two commercially available products supplied by Organic Crop Protectants http://ocp.com.au/ were used in this trial; Colonizer® T. *koningii* (Td67) and Antagoniser® T. *harzianum* (Td81b). These were compared with current grower's practice, leaf removal and control treatments without botrytis fungicide application.

Key Messages

- Adopt holistic approaches to botrytis and non-botrytis bunch rot control as numerous management options may be required within the one season.
- Ensure product compatibility when selecting and using biological inputs.
- Coverage is paramount, ensure all spray equipment is set up correctly to cover entire flower and bunch structures.
- Leaf removal of the bunch zone offers potential to assist in drying bunches from surface wetness. This measure also allows for greater spray coverage of flowers and bunches.
- Trichoderma strains are many and varied and have different capabilities. Selection of the right one is critical to disease suppression within different vineyards and climates.

Table 1: Treatments, chemicals and dates applied in Hunter Valley.

Treatment	Product/Actives	Date Applied
Control	Water	3/11/14, 24/11/14, 7/1/15 & 20/1/15
Control + leaf removal *	Water	3/11/14, 24/11/14*, 7/1/15 & 20/1/15
Current Practice	Teldor® Fenhexamid 500 g/L	3/11/14
	Switch® Cyprodinil 375g/Kg Fludioxonil 250g/Kg	24/11/14
	Chief® Ipropdione 500 g/L	7/1/15 & 20/1/15
Biological	Colonizer® T. koningii (Td67) 1011 cfu/gram	3/11/14 & 24/11/14
	Antagoniser® T. harzianum (Td81b) 1011 cfu/gram	7/1/15 & 20/1/15

Growth Stages: 3/11/14 – 30% Flowering (EL21), 24/11/14 – 80% Capfall (EL25), 7/1/15 – Veraison (EL35), 20/1/15 – Mid veraison (EL37), *Leaf Removal conducted @ (EL25) 80% bunch closure.

Application Strategy

In 2014-15 an experimental trial was conducted across two separate vineyards located at Pokolbin and Broke in the Lower Hunter Valley on own-rooted Shiraz vines to assess 4 treatments (Table 1.) which were replicated 5 times each across blocks of 9 vines in the vineyard. The treatments were arranged in a randomised complete block design.

Timing of spray applications followed current farmer's practice occurring between 20 - 80% capfall. This timing was also consistent with the manufacturer's recommendation for the application of biological products, with all products assessed as compatible according to the manufacturer. Leaf removal was carried out at 80% capfall (EL 25) with water applied to this and control treatments at the same time as other treatments, to ensure all treatments received the same amount of applied water. Applications of products to all treatments were carried out across both sites on the same day, using individual 5L calibrated knapsack spray equipment for each separate product. All products were applied at manufacturer's application and water rates per hectare.

No other spraying was conducted across the trial sites except for routine copper and sulphur sprays conducted by landholders.

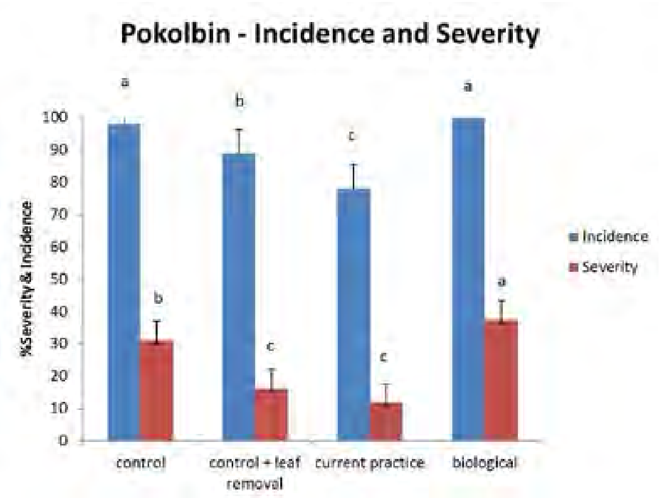

Figure 1. Incidence and Severity of Botrytis on February 10, 2015 in an experimental site at Pokolbin. Different letters indicate significantly different values at P<0.01

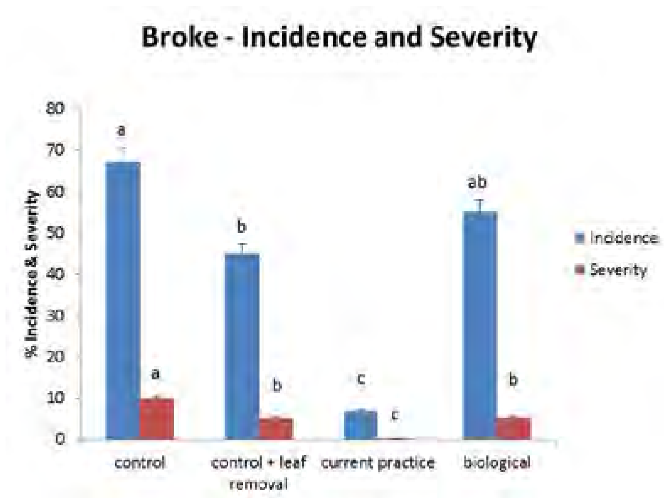

Figure 2. Incidence and Severity of Botrytis on February 10, 2015 in an experimental site at Broke. Different letters indicate significantly different values at P<0.01

Outcomes

Rainfall across the Hunter Valley throughout the 2015 vintage posed a significant risk for botrytis and non-botrytis bunch rots, with the majority of the rainfall across the vintage period occurring between Dec and Jan with 191.6mm and 227.8mm (BOM 61298), respectively recorded at Pokolbin, and 277mm and 158mm (BOM 61422) recorded at Broke. The rainfall received equates to twice the annual average for both months at both recording sites. Hail damage resulted from storms which impacted the Broke site on 7th December causing minor damage to berries.

Just prior to commercial harvest (February 10, 2015) the level of incidence and severity of botrytis infection on bunches was estimated from 20 randomly selected bunches per replicate. The botrytis assessment was conducted with the aid of a standard area diagram (Evans et al. 2012). Non-botrytis rots were evident across the trial however data is for the severity and incidence is not included in the results.

Looking at results from the Pokolbin site (Figure 1), botrytis was present in all treatments with botrytis incidence significantly higher in the biological and control treatments compared to the leaf removal and current practice treatment which resulted in the lowest incidence levels. The severity of botrytis was significantly lower in the current practice and leaf removal treatments compared to the control and biological treatments.

At the Broke site (Figure 2), botrytis was present in all treatments with botrytis incidence significantly higher in the control, biological and leaf removal treatment than current practice. The severity of botrytis was also significantly lower for the current practice than the control, biological and leaf removal treatments.

Discussion

The conditions experienced across Pokolbin and Broke trial sites were ideal for the development of botrytis and non-botrytis bunch rots in all treatments.

Picture 1. An unaffected shiraz bunch (left) and a bunch heavily affected by botrytis (right)

The high incidence and severity of botrytis in the biological treatment at both sites was unexpected given anecdotal evidence to support its efficacy. The outcomes resulting from this trial may be related to the low performance of the Trichoderma products Coloniser® and Antagoniser® under warm humid conditions as it was isolated from grapes grown in the cool climate of Tasmania. In support of the suitability of the commercial Trichoderma products Coloniser® and Antagoniser®, replicated trials conducted in the cool climate NSW region of Orange demonstrated that these products significantly lowered severity equal to that of the current practice treatments. Therefore, the isolation of naturally occurring Trichoderma species from warm humid regions should be investigated.

Leaf removal to open up the bunch zone demonstrated a limited potential at reducing incidence across both sites with further investigation warranted, perhaps in-conjunction with the application of commercially available sunscreen products, as it is likely that exposing bunches with leaf removal, berries may become more susceptible to heat and/or sun damage.

The reduction in botrytis under current practice treatments resulted in significantly lower incidence and severity across both trial sites in a high pressure year.

Picture 2. A vigorous Shiraz grapevine resulting in excessive fruit shading and little air penetration

Picture 3. Shiraz grapevine after leaf removal to encourage light and air penetration

Acknowledgements

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Picture 4. Targeted leaf removal around the bunch zone has increased light and air penetration into the canopy, reducing botrytis infection risk.

Picture 5. A shiraz bunch at harvest with no signs of bunch rot.

Picture 6. A shiraz bunch severely affected by bunch rot.

Picture 7. A close up of berries affected by bunch rots showing the hyphae of the fungus.

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